

Notulae to the Italian alien vascular flora: 6

Gabriele Galasso¹, Giannantonio Domina², Alessandro Alessandrini³,
Nicola M.G. Ardenghi⁴, Gianluigi Bacchetta⁵, Sandro Ballelli⁶,
Fabrizio Bartolucci⁷, Giuseppe Brundu⁸, Sergio Buono⁹, Giuseppe Busnardo¹⁰,
Giacomo Calvia⁵, Paolo Capece¹¹, Marco D'Antraccoli¹²,
Luca Di Nuzzo¹³, Emanuele Fanfarillo¹⁴, Giulio Ferretti¹³, Riccardo Guarino¹⁵,
Duilio Iamonico¹⁶, Mauro Iberite¹⁴, Marta Latini¹⁴, Lorenzo Lazzaro¹³,
Michele Lonati¹⁷, Vanessa Lozano⁸, Sara Magrini¹⁸, Giacomo Mei¹⁹,
Giuliano Mereu²⁰, Andrea Moro²¹, Michele Mugnai¹³, Gianluca Nicolella²²,
Pier Luigi Nimis²¹, Nicola Olivieri²³, Riccardo Pennesi²¹, Lorenzo Peruzzi¹²,
Lina Podda⁸, Massimiliano Probo²⁴, Filippo Prosser²⁵, Simone Ravetto Enri¹⁷,
Francesco Roma-Marzio¹², Alessandro Ruggero²⁶, Filippo Scafidi²,
Adriano Stinca²⁷, Chiara Nepi²⁸

1 Sezione di Botanica, Museo di Storia Naturale di Milano, Corso Venezia 55, 20121 Milano, Italy **2** Dipartimento di Scienze Agrarie, Alimentari e Forestali (SAAF), Università di Palermo, Viale delle Scienze, ed. 4, 90128 Palermo, Italy **3** Istituto Beni Culturali, Regione Emilia-Romagna, Via Galliera 21, 40121 Bologna, Italy **4** Dipartimento di Scienze della Terra e dell'Ambiente, Università di Pavia, Via Sant'Epifanio 14, 27100 Pavia, Italy **5** Centro Conservazione Biodiversità, Dipartimento di Scienze della Vita e dell'Ambiente, Università di Cagliari, Viale Sant'Ignazio da Laconi 13, 09123 Cagliari, Italy **6** Scuola di Bioscienze e Medicina Veterinaria, Università di Camerino, Via Pontoni 5, 62032 Camerino (Macerata), Italy **7** Centro Ricerche Floristiche dell'Appennino (Università di Camerino - Parco Nazionale del Gran Sasso e Monti della Laga), San Colombo, 67021 Barisciano (L'Aquila), Italy **8** Dipartimento di Agraria, Università di Sassari, Viale Italia 39, 07100 Sassari, Italy **9** Via XXV Aprile 6, 01010 Oriolo Romano (Viterbo), Italy **10** Viale XI Febbraio 22, 36061 Bassano del Grappa (Vicenza), Italy **11** Agenzia Regionale per la Protezione dell'Ambiente della Sardegna (ARPAS), Viale Porto Torres 119, 07100 Sassari, Italy **12** Unità di Botanica, Dipartimento di Biologia, Università di Pisa, Via Derna 1, 56126 Pisa, Italy **13** Dipartimento di Biologia, Università di Firenze, Via G. La Pira 4, 50121 Firenze, Italy **14** Dipartimento di Biologia Ambientale, Sapienza Università di Roma, Piazzale A. Moro 5, 00185 Roma, Italy **15** Sezione di Botanica ed Ecologia Vegetale, Dipartimento di Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche (STEBICEF), Università di Palermo, Via Archirafi 20, 90123 Palermo, Italy **16** Dipartimento di Pianificazione, Design, Tecnologia dell'Architettura (PDTA), Sapienza Università di Roma, Via Flaminia 72, 00196 Roma, Italy **17** Dipartimento di Scienze Agrarie, Forestali e Alimentari (DISAFA), Università di Torino, Largo P. Braccini 1, 10095 Grugliasco (Torino), Italy **18** Banca del Germoplasma della Tuscia, Università della Tuscia, Largo dell'Università snc, blocco c, 01100

Viterbo, Italy **19** Dipartimento di Scienze Agrarie, Alimentari ed Ambientali, Università Politecnica delle Marche, Via Brecce Bianche 10, 60131 Ancona, Italy **20** Via Alghero 17, 08042 Bari Sardo (Nuoro), Italy **21** Dipartimento di Scienze della Vita, Università di Trieste, Via L. Giogieri 10, 34127 Trieste, Italy **22** Via di Valle Melaina 61, 00139 Roma, Italy **23** Via Maestri del Lavoro 40, 64100 Teramo, Italy **24** Grazing Systems, Agroscope, Route de Duillier 50, 1260 Nyon, Switzerland **25** Fondazione Museo Civico di Rovereto, Largo Santa Caterina 41, 38068 Rovereto (Trento), Italy **26** Loc. Parapinta, 07029 Tempio Pausania (Sassari), Italy **27** Dipartimento di Scienze e Tecnologie Ambientali, Biologiche e Farmaceutiche, Università della Campania Luigi Vanvitelli, Via A. Vivaldi 43, 81100 Caserta, Italy **28** Museo di Storia Naturale (Botanica), Sistema Museale di Ateneo, Università di Firenze, Via G. La Pira 4, 50121 Firenze, Italy

Corresponding author: Gabriele Galasso (gabriele.galasso@comune.milano.it)

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Abstract

In this contribution, new data concerning the distribution of vascular flora alien to Italy are presented. It includes new records, confirmations, exclusions, and status changes for Italy or for Italian administrative regions of taxa in the genera *Acalypha*, *Acer*, *Canna*, *Cardamine*, *Cedrus*, *Chlorophytum*, *Citrus*, *Cyperus*, *Epilobium*, *Eucalyptus*, *Euphorbia*, *Gamochaeta*, *Hesperocyparis*, *Heteranthera*, *Lemna*, *Ligustrum*, *Lycium*, *Nassella*, *Nothoscordum*, *Oenothera*, *Osteospermum*, *Paspalum*, *Pontederia*, *Romulea*, *Rudbeckia*, *Salvia*, *Sesbania*, *Setaria*, *Sicyos*, *Styphnolobium*, *Symphytum*, and *Tradescantia*. Nomenclature and distribution updates, published elsewhere, and corrigenda are provided as supplementary material.

Keywords

Alien species, floristic data, Italy

How to contribute

The text for the new records should be submitted electronically to Chiara Nepi (chiara.nepi@unifi.it). The corresponding specimen along with its scan or photograph has to be sent to FI Herbarium: Museo di Storia Naturale (Botanica), Sistema Museale di Ateneo, Via G. La Pira 4, 50121 Firenze (Italy). Those texts concerning nomenclatural novelties (typifications only for accepted names), status changes, exclusions, and confirmations should be submitted electronically to: Gabriele Galasso (gabriele.galasso@comune.milano.it). Each text should be within 2,000 characters (spaces included).

Floristic records

Acalypha australis L. (Euphorbiaceae)

+ (CAS) **LAZ**: Castrocielo (Frosinone), loc. Capodacqua (WGS84: 41.518520°N; 13.708890°E), prato, 110 m, 23 September 2016, *G. Nicolella, M. Iberite* (FI, RO). – Casual alien species new for the flora of Lazio.

This record is the first one for peninsular Italy, as the taxon was known only for some northern regions (Galasso et al. 2018a). This Asiatic species was observed growing on the left shore of a small lake characterized by disturbed vegetation, along with *Bidens vulgaris* Greene (Nicolella et al. 2017), *Lemna minuta* Kunth, *Zantedeschia aethiopica* (L.) Spreng., and other alien species. The introduction of *Acalypha australis* in Italy is probably accidental, and related both to plant nursery activities (Banfi and Galasso 2010) and contamination of agricultural seeds (Kravchenko 2008). It naturally colonizes river banks and other wet habitats, and it is a feared weed in agriculture, with special regard to its ability to spread into maize fields (Zuo et al. 2008). This population was also reported in the Acta Plantarum Forum (<http://www.floraitaliae.actaplantarum.org/viewtopic.php?t=102122>).

E. Fanfarillo, D. Iamonico, M. Iberite, M. Latini, G. Nicolella

Acer saccharinum L. subsp. *saccharinum* (Sapindaceae)

+ (CAS) **ABR**: Teramo (Teramo), Via A. De Gasperi, presso l'alveo del Torrente Vezzola (WGS84: 42.662558°N; 13.708741°E), margine stradale, ca. 252 m, 20 June 2018, *N. Olivieri* (FI). – Casual alien subspecies new for the flora of Abruzzo.

Some young individuals grow near a street edge in a cool and shady area located at the base of a slope, on arenaceous soil, not far from the Stream Vezzola, together with *Parietaria judaica* L. and young individuals of *Celtis australis* L. subsp. *australis*, *Laurus nobilis* L., *Quercus pubescens* Willd. subsp. *pubescens*, and *Viburnum tinus* L. subsp. *tinus*. The young plants originated from the samaras produced by two trees planted nearby for ornamental purposes. This species is native to the eastern regions of North America and was introduced in Italy in 1760 (Maniero 2015) as an ornamental plant, marked by rapid growth.

N. Olivieri

Canna indica L. (Cannaceae)

+ (CAS) **MAR**: San Benedetto del Tronto (Ascoli Piceno), lungo la ferrovia all'interno dell'abitato presso Via G. Sgambati (WGS84: 42.941111°N; 13.887777°E), margine della massicciata ferroviaria, ca. 6 m, E, 10 July 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Marche.

A group of plants are located on the edge of the railway embankment, close to the Adriatic Sea, on rather damp gravelly substratum, beneath a young individual of *Phoenix canariensis* H.Wildpret. In the area the herbaceous vegetation is mainly constituted by *Equisetum ramosissimum* Desf. and *Parietaria judaica* L.

N. Olivieri

***Cardamine occulta* Hornem. (Brassicaceae)**

+ (CAS) **MAR**: Camerino (Macerata), Viale G. Leopardi 14, at the Botanical Garden (WGS84: 43.136004°N; 13.069947°E), greenhouse soil, synanthropic habitat, 635 m, no exp., 30 March 2018, S. Ballelli, R. Pennesi (FI, CAME); Fabriano (Ancona), Piazzale Santa Maria Maddalena (WGS84: 43.331993°N; 12.899302°E), flower vases soil, synanthropic habitat, 340 m, no exp., 5 April 2018, S. Ballelli (FI, CAME). – Casual alien species new for the flora of Marche.

+ (CAS) **UMB**: Foligno (Perugia), Via Gran Sasso 23, near Restaurant Winner (WGS84: 42.960197°N; 12.689901°E), flower vases soil, synanthropic habitat, 230 m, no exp., 23 February 2014, S. Ballelli (FI, CAME). – Casual alien species new for the flora of Umbria.

Several authors reported this taxon under different names, but Marhold et al. (2016) clarified that the oldest name applicable for the so-called “Asian *Cardamine flexuosa*” is *C. occulta*. In Italy, *C. occulta* was first found in Sardegna (Lazzeri et al. 2013, under the name *C. flexuosa* With. subsp. *debilis* O.E.Schulz), then in other Italian regions (Toscana and Lombardia: Ardenghi and Mossini 2014, under the name *C. flexuosa* subsp. *debilis*; Piemonte: Verloove and Ardenghi 2015, under the name *C. hamiltonii* G.Don; Veneto: Marhold et al. 2016; Trentino-Alto Adige: Galasso et al. 2016a; Campania: Stinca et al. 2017; Lazio: Galasso et al. 2018b). The present findings broaden its distribution in central Italy both in Marche and Umbria. *Cardamine occulta* has been found growing together with the similar *C. hirsuta* L. in urban environments, especially in flower pots. Its presence in these regions could date back to several years ago; additionally its distribution may be much broader than reported, given the possible confusion with *C. hirsuta* (see Šlenker et al. 2018 for differences).

S. Ballelli, R. Pennesi

***Cedrus atlantica* (Endl.) G.Manetti ex Carrière (Pinaceae)**

+ (NAT) **SAR**. – Status change from casual to naturalized alien for the flora of Sardegna.

This species is endemic to the Atlas Mountains, in Morocco and Algeria, but it has been used in reforestation and as an ornamental tree in many countries (Farjon 2017). In Sardegna it was reported as cultivated by Pavari and De Philippis (1941), and recently indicated as a casual alien species (Bacchetta et al. 2009, Puddu et al. 2016, Galasso et al. 2018a). Actually, the species is naturalized in those places where it was abundantly introduced since the 1930s, such as the State Forests of Bono, Bultei, Ane-

la, and Monte Limbara (Pavari and De Philippis 1941), but also in the State Forests of Orgosolo, Arzana, and Villagrande Strisaili (Montes, M. Idol, Bau Muggeris). In these sites, there is an important renewal and adult trees occur in woodlands, garrigues, heaths, roadsides, and reforestations.

G. Bacchetta, G. Calvia, A. Ruggero

Chlorophytum comosum (Thunb.) Jacques (Asparagaceae)

+ (CAS) **ABR**: Teramo (Teramo), bordo di Via C. Battisti (WGS84: 42.659936°N; 13.703644°E), margine stradale, ca. 268 m, 14 June 2018, N. Olivieri (FI). – Casual alien species new for the flora of Abruzzo.

Some individuals of this species can be found near the edge of the road and the base of a building in a shady and humid site, near a rain gutter downspout, in a central area of the town. Probably these individuals were vegetatively generated from plants grown as ornamentals on surrounding buildings. *Chlorophytum comosum* is native to southern Africa and is a popular cultivated plant.

N. Olivieri

Citrus ×aurantium L. (Rutaceae)

+ (CAS) **MAR**: San Benedetto del Tronto (Ascoli Piceno), presso Viale delle Palme (WGS84: 42.950919°N; 13.884188°E), aiuola occupata da arbusti di *Westringia fruticosa*, ca. 8 m, 10 July 2018, N. Olivieri (FI). – Casual alien nothospecies new for the flora of Marche.

A young individual has grown within a flowerbed of a public garden, among shrubs of *Westringia fruticosa* (Willd.) Druce and *Melaleuca citrina* (Curtis) Dum.Cours. The place is located at short distance from the Adriatic Sea and is protected from cold easterly winds by the presence of *Pinus halepensis* Mill. subsp. *halepensis* trees and buildings. The young plant probably originated from seeds produced by an adult specimen cultivated in the gardens not far away. Along the southernmost part of the Marche coast, the cultivation of *Citrus ×aurantium* and other *Citrus* fruits has been present since the 12th century D.C. (Zavatti 1966, Manzi and Vitelli 2016).

N. Olivieri

Cyperus microiria Steud. (Cyperaceae)

+ (CAS) **TOS**: Pisa (Pisa), nei pressi dell'aeroporto (WGS84: 43.691115°N; 10.412054°E), campi coltivati, ca. 5 m, 17 October 2017, R. Guarino (FI). – Casual alien species new for the flora of Toscana.

This is a late-flowering annual species of eastern Asiatic origin, widely naturalized in Europe and U.S.A. (Verloove 2014). In Italy, it was first collected near Como in 1908

(Camperio and Fiori 1910) and currently it is recorded as invasive alien in Lombardia and Emilia-Romagna, naturalized in Piemonte and Veneto, and casual in Trentino-Alto Adige and Friuli Venezia Giulia (Galasso et al. 2018a). Our finding, in a regularly disturbed field edge next to the airport of Pisa, is the first record south of the Apennines because a previous record from Calabria was found to be erroneous (Galasso et al. 2016b, 2018a).

R. Guarino, L. Peruzzi

Epilobium brachycarpum C.Presl (Onagraceae)

+ (NAT) **ITALIA (EMR)**: Bologna (Bologna), scalo merci di Bologna San Donato, tratto compreso tra il Posto A e il Posto B (WGS84: 44.506283°N; 11.390399°E), pietrisco fine e compattato di natura calcareo-marnosa tra i binari, 50 m, 26 September 2017, leg. A. Alessandrini, det. N.M.G. Ardenghi (FI). – Naturalized alien species new for the flora of Italy (Emilia-Romagna).

Epilobium brachycarpum is a therophyte native to western North America. In Europe, it was first recorded in Spain in 1978 and, by the 1990s, in different countries of the central and north-western parts of the continent: France, Germany, Belgium, and United Kingdom. It colonizes disturbed, dry and warm habitats characterized by short-lived ruderal communities, with a distinct preference for railway areas, where many of the European records come from (Izco 1983, Bönsel and Ottich 2005, Verloove and Lambinon 2009, Gregor et al. 2013, Remacle 2014). It is regarded as an invasive species in central Europe (Nierbauer et al. 2016), its rapid expansion being promoted by the high production of seeds, dispersed by wind and probably vehicles, and the strong competition on bare soils with other ruderal plants (Gregor et al. 2013). The population discovered in Bologna is located at the entrance of the almost disused freight yard of Bologna San Donato that has been one of the most important railway yards in Europe. In summer, *E. brachycarpum* forms a dense monospecific stand, covering an area of about 50 ha. Due to the population extent, it is likely that the species was introduced years ago, probably through imported freight or railroad cars from France (via the Torino-Milano-Bologna line) or Germany (via the Verona-Bologna line). Photos of the population are available at: <http://www.floraitaliae.actaplantarum.org/viewtopic.php?t=99257>.

A. Alessandrini, N.M.G. Ardenghi

Eucalyptus polyanthemos Schauer subsp. *polyanthemos* (Myrtaceae)

+ (CAS) **ITALIA (SAR)**: Villacidro (Sud Sardegna), Campu s'Isca, Rio Leni (WGS84: 39.39538°N; 8.65812°E), materassi alluvionali granitico-metamorfici, 329 m, 20 July 2018, G. Bacchetta, G. Brundu, L. Podda (FI, CAG). – Casual alien subspecies new for the flora of Italy (Sardegna).

This Australian species, identified according to the Centre for Plant Biodiversity Research (2006) and Slee et al. (2015), was introduced in Sardegna for reforestation in the period 1914–1921. It shows a scarce tendency to naturalization, unlike *E. camaldulensis* Dehnh. subsp. *camaldulensis* and *E. globulus* Labill. subsp. *globulus*, occurring only with a dozen young trees near the reforestation site.

G. Bacchetta, G. Brundu, L. Podda

Euphorbia berteroana Balb. ex Spreng. (Euphorbiaceae)

– **ITALIA (SIC).** – Alien species to be excluded from the flora of Italy (Sicilia).

On the basis of the following record concerning *E. ophthalmica* Pers., this species should be excluded from Italy.

M. Mugnai, L. Di Nuzzo, L. Lazzaro, G. Ferretti

Euphorbia hypericifolia L. (Euphorbiaceae)

+ (CAS) **PUG:** Melendugno (Lecce), fraz. Borgagne, nella masseria (WGS84: 40.239834°N; 18.376283°E ± 1 Km), 20 m, unica pianta presente nel sito, 23 June 2014, E.S. Mauri (FI sub *Chamaesyce hyssopifolia*). – Casual alien species new for the flora of Puglia.

On the basis of the following record concerning *E. hyssopifolia* L., *E. hypericifolia* should be considered as new for the flora of Puglia. Indeed, the Apulian record of *Euphorbia hyssopifolia* by Buono et al. (2017) should be referred to *E. hypericifolia*.

M. Mugnai, L. Di Nuzzo, L. Lazzaro, G. Ferretti

Euphorbia hyssopifolia L. (Euphorbiaceae)

– **ITALIA (PUG, SIC).** – Alien species to be excluded from the flora of Italy (Puglia and Sicilia).

Euphorbia hyssopifolia was recorded as new for the flora of Italy by Banfi and Galasso (2014), based on specimens collected in Sicilia, and it was subsequently reported in Puglia by E.S. Mauri in Buono et al. (2017). We analysed the exsiccata from Sicilia and Puglia conserved in FI. These specimens were compared to scans of type specimen and revised according to Ma and Gilbert (2008) and Steinmann et al. (2016). We also submitted the specimens to Victor Steinmann, an expert of *Euphorbia* sect. *Anisophyl-lum* Roep. According to our inquiries, both records correspond to *Euphorbia hypericifolia* L., a species reported so far in Italy for Toscana and Sicilia (Galasso et al. 2018a). Accordingly, *E. hyssopifolia* should be excluded from the flora of Italy.

M. Mugnai, L. Di Nuzzo, L. Lazzaro, G. Ferretti

***Euphorbia ophthalmica* Pers. (Euphorbiaceae)**

+ (CAS) **ITALIA (SIC):** Palermo (Palermo), in cultis, in H.B. Panorm copiosa sponte qui crescit (WGS84: ca. 38.112642°N; 13.374495°E), September 1880, *M. Lojacono Pojero* (P sub *E. berteroana*); *ibidem*, in cultis humentibus subsponte in Hortis Palermo (WGS84: ca. 38.112642°N; 13.374495°E), October 1882, *M. Lojacono Pojero* (FI sub *E. berteroana*); *ibidem*, subsponte in Hortis Palermo (WGS84: ca. 38.112642°N; 13.374495°E), September 1883, *M. Lojacono Pojero* (FI sub *E. berteroana*); *ibidem*, subsponte in H.B. Panorm (WGS84: ca. 38.112642°N; 13.374495°E), August 1886, *s.c.* (TO sub *E. berteroana*); *ibidem*, culta in R.H.B.P. (WGS84: ca. 38.112642°N; 13.374495°E), s.d., *s.c.* (PAL No. 51733 sub *E. berteroana*); Catania (Catania), als Unkraut im Botanischen Garten Catania [infestante nel giardino botanico di Catania] (WGS84: ca. 37.515680°N; 15.083732°E), September 1928, leg. *K. Müller* sub *E. nutans*, revidit *G. Hügin* 1995 sub *E. hirta*, revidit *G. Hügin* 1997 sub *E. berteroana* (STU); Ribera (Agrigento), Azienda Pizzuto, infestante degli agrumeti (WGS84: 37.500000°N; 13.267000°E ± 2 Km), agrumeti, sporadica, s.d. [1970s: *G. Ferro*, in verbis], *G. Ferro* (FI sub *E. berteroana*); *ibidem*, Fondo Cipolla, negli agrumeti (WGS84: 37.500000°N; 13.267000°E ± 2 Km), agrumeti, ca. 100 m, s.d. [1970s: *G. Ferro*, in verbis], *G. Ferro* (FI sub *E. berteroana*); *ibidem*, infestante degli agrumeti (WGS84: 37.500000°N; 13.267000°E ± 2 Km), agrumeti, 200 m, non molto diffusa, s.d. [1970s: *G. Ferro*, in verbis], *G. Ferro* (FI sub *E. berteroana*); *ibidem* (WGS84: 37.500000°N; 13.267000°E ± 2 Km), ai margini di un frutteto (quasi ruderale), ca. 180 m, s.d. [1970s: *G. Ferro*, in verbis], *G. Ferro* (FI sub *E. berteroana*). – Casual alien species new for the flora of Italy (Sicilia).

We revised the herbarium specimens from Italy referred to *E. berteroana* Balb. ex Spreng., concluding that they should be referred to *E. ophthalmica*. Indeed, *E. berteroana* was reported in Sicilia at the turn of the 20th century by Lojacono Pojero (1907) and cited by Fiori (1926, 1928), Giardina et al. (2007), and Pignatti (1982, 2017). Nevertheless, Galasso et al. (2018a) do not mention *E. berteroana* as occurring in Italy. We searched for herbarium specimens that could be linked to such reports, retrieving exsiccata preserved in FI, P, PAL, and TO. In addition, we retrieved more recent specimens of *E. berteroana* in STU, collected in 1928 by *K. Müller*, and in FI, collected in the 1970s by *G. Ferro*. Such material was compared to the type material and revised using different identification keys (Burch 1965, Steinmann et al. 2016, Burger and Huft 1995) and the expert opinion of Victor Steinmann. *Euphorbia berteroana* shows affinities with *E. ophthalmica* and *E. hirta* L., but can be clearly distinguished from these species. Indeed, *E. berteroana* shows ovate-elliptic leaf blades with obtuse apex, while *E. hirta* and *E. ophthalmica* leaves show leaf blades generally rhombic, with acute apex. In addition, *E. ophthalmica* differs from *E. hirta* in having capitula strictly terminal or on leafy lateral stalks, and stem branching from base to tips. Our conclusion is that the Italian exsiccata correspond to *Euphorbia ophthalmica*, a species never recorded before for Italy. In addition, based on the revised herbarium specimens, the true *E. berteroana* was never collected in Italy, and the reports by Lojacono Pojero

(1907), Fiori (1926, 1928), Giardina et al. (2007), and Pignatti (1982, 2017) should be considered erroneous.

M. Mugnai, L. Di Nuzzo, L. Lazzaro, G. Ferretti

Euphorbia prostrata Aiton (Euphorbiaceae)

+ (NAT) **SAR.** – Status change from casual to naturalized alien for the flora of Sardegna.

This is a species native to North America (Pignatti 2017), which behaves as invasive alien in Italy and casual in Sardegna (Galasso et al. 2018a). It was reported from various localities of southern Sardegna by Bocchieri et al. (1982) and Bocchieri (1984), and then confirmed by Arrigoni (2010). Later, Puddu et al. (2016) indicated it as a casual alien in Sardegna, while Camarda et al. (2016) reported it as naturalized. It is widespread in Gallura, Logudoro, Ogliastra, Sulcis-Iglesiente, Sarrabus-Gerrei and Campidano, from sea level to 1,050 m a.s.l., along roadsides and in fallow land, ruderal places, and gardens, mainly on sandy granitic soils.

G. Bacchetta, G. Calvia, L. Podda, A. Ruggero

Euphorbia thymifolia L. (Euphorbiaceae)

– **ITALIA (LIG, TOS, LAZ).** – Alien species to be excluded from the flora of Italy (Liguria, Toscana, and Lazio).

To our knowledge, *Euphorbia thymifolia* was reported (sub *E. thymifolia* Burm.) for the first time for the flora of Italy in Toscana by Arcangeli (1894), and subsequently for Lazio and Toscana by Chiovenda (1895). This species was also tentatively recorded by Sommier (1898) for Valle d'Aosta. However, the same author stated that all his previous reports should be actually referred to *E. maculata* L. instead of *E. thymifolia* (Sommier 1903), as confirmed in Fiori (1901) for all Italian specimens and recently by Bovio (2014) for Valle d'Aosta. Notwithstanding, *E. thymifolia* was subsequently reported as a literature record (Viegi and Cela Renzoni 1981, Del Prete et al. 1991, Arrigoni and Viegi 2011), confirmed for Lazio and Toscana as a naturalized alien species and recorded as historical record for Liguria (Galasso et al. 2018a). We revised the specimens collected by Chiovenda (FI and RO) according to Steinmann et al. (2016) and Hügin (1998), and we attributed them to *E. maculata* (in agreement with Sommier 1903 and Fiori 1901). In addition, we revised herbarium specimens of *E. maculata* and *E. thymifolia* in FI, FIAF, PI, and RO, concluding that all these specimens correspond to *E. maculata*. Accordingly, *E. thymifolia* should be excluded from the Italian alien flora. These two species are similar, but clearly distinguishable by capsules scarcely exserted from the involucre at maturity in *E. thymifolia* vs., well exserted in *E. maculata*.

M. Mugnai, L. Di Nuzzo, L. Lazzaro, G. Ferretti

Gamochaeta argyrinea G.L.Nesom (Asteraceae)

+ (NAT) **SAR**: Arzachena (Sassari), Nuraghe La Prisgiona (WGS84: 41.025332°N; 9.214608°E), macchie, 130 m, 30 April 2012, *G. Calvia* (*Herb. Calvia, Berchidda*); *ibidem*, Tomba di Giganti Coddu ‘Ecchju (WGS84: 41.030579°N; 9.212391°E), prati, inculti, 90 m, 30 April 2012, *G. Calvia* (*Herb. Calvia, Berchidda*); *ibidem*, loc. Capichera, dintorni della Tomba di Giganti Coddu ‘Ecchju (WGS84: 41.030027°N; 9.212321°E), prati, inculti, cigli stradali, 85–90 m, 21 July 2018, *G. Calvia* (FI, CAG).

– Naturalized alien species new for the flora of Sardegna.

Gamochaeta argyrinea is native to North America (Nesom 2006). According to Galasso et al. (2018a), it is a naturalized alien in Toscana. In Sardegna, it was found in the countryside of Arzachena, and collected in April 2012. It is known from at least five localities, but apparently expanding.

G. Calvia

Hesperocyparis arizonica (Greene) Bartel (Cupressaceae)

+ (CAS) **LAZ**: Alatri (Frosinone) (WGS84: 41.742540°N; 13.327508°E), sotto e nei pressi di rimboschimenti a conifere, 570 m, 9 February 2018, E. Fanfarillo (FI, RO).

– Casual alien species new for the flora of Lazio.

This northwestern American species, widely used for ornamental purposes and re-forestations, is reported as casual for many Italian regions and as naturalized in Toscana (Galasso et al. 2018a). Many small individuals were observed near and under cultivated plants, colonizing the understory of a degraded conifer plantation.

E. Fanfarillo, D. Iamonico, M. Iberite, M. Latini, G. Nicolella

Hesperocyparis macrocarpa (Hartw. ex Gordon) Bartel (Cupressaceae)

+ (NAT) **LAZ**: Alatri (Frosinone) (WGS84: 41.744605°N; 13.327046°E), sotto e nei pressi di rimboschimenti a conifere, 550 m, 9 February 2018, E. Fanfarillo (FI, RO).

– Naturalized alien species new for the flora of Lazio.

So far, this species was reported as casual in Umbria and Sardegna (Galasso et al. 2018a). Many sexually reproductive individuals originated from cultivated plants, some of which are several metres tall. Although not previously observed, the size of the individuals and the occurrence of several fertile generations suggest that the population is self-sustaining. Thus, the species can be considered as naturalized in Lazio.

E. Fanfarillo, D. Iamonico, M. Iberite, M. Latini, G. Nicolella

+ (CAS) **MOL**: Petacciato (Campobasso), fraz. Marina di Petacciato (WGS84: 42.032463°N; 14.860958°E), margine di impianto di rimboschimento costiero,

ca. 3 m, 16 June 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Molise.

Some young individuals of the species grow on the edge of an artificial pine forest composed mainly of *Pinus halepensis* Mill. subsp. *halepensis* and *Pinus pinea* L., along with *Acacia saligna* (Labill.) H.L.Wendl., *Cupressus sempervirens* L., *Eucalyptus camaldulensis* Dehnh. subsp. *camaldulensis*, and *Hesperocyparis macrocarpa*. They are located on a sandy soil, in shady areas not far from the Adriatic coast. *Hesperocyparis macrocarpa* is an American species native to California, where it lives in two small areas southwest of the city of Monterey. The species was introduced in Italy in 1851 (Maniero 2015) and is planted especially in coastal areas as a windbreak.

N. Olivieri

Heteranthera reniformis Ruiz & Pav. (Pontederiaceae)

+ (CAS) **SAR**: Cabras (Oristano), nei pressi dello stagno di Cabras (WGS84: 39.96151°N; 8.51118°E), risaia, 6 m, 9 August 2017, leg. V. Lozano, P. Capece, G. Brundu, det. G. Brundu (FI, SS). – Casual alien species new for the flora of Sardegna.

Heteranthera reniformis is an annual or pluriannual submerged or floating plant, native to freshwater wetlands of North, Central, and South America (Hussner 2012). This species was introduced accidentally in Europe, probably with seeds of rice, and it is also widely cultivated as ornamental plant.

V. Lozano, P. Capece, G. Brundu

Lemna minuta Kunth (Araceae)

+ (INV) **TOS**. – Status change from casual to invasive alien for the flora of Toscana.

Lemna minuta is native to temperate and subtropical areas of America (Banfi and Galasso 2010), and it is recorded as invasive or naturalized alien in almost all Italian Regions (Galasso et al. 2018a). In Toscana, this species was recorded for the first time in the Migliarino-San Rossore-Massaciuccoli Regional Park by Peruzzi and Savio (2011). Although these authors reported the species as casual alien, they suggested to carefully monitor it, hypothesizing an ongoing naturalization process. During field surveys in the same areas, we observed that this species is widely distributed. Moreover, in the meantime, *L. minuta* was recorded for several other sites in Toscana (Lastrucci et al. 2016, Carta et al. 2018). We noticed that *Lemna minuta* commonly shares the habitat with the native species *L. minor* L. and/or *L. gibba* L., generally behaving as a strong competitor. Considering the quick expansion and the severe competition with native species, we retain most appropriate the status of invasive alien in Toscana for *L. minuta*.

M. D'Antraccoli, F. Roma-Marzio

Ligustrum sinense Lour. (Oleaceae)

+ (CAS) **VDA**: Arnad (Aosta), fraz. Arnad le Vieux (WGS84: 45.645338°N; 7.720963°E), giovani individui naturalizzati nelle zone incolte e muretti a secco presso la sede comunale, 368 m, 15 October 2017, *M. Lonati, S. Ravetto Enri, M. Probo* (FI). – Casual alien species new for the flora of Valle d’Aosta.

Young individuals were observed in fallows and dry stone walls. They originated from seeds from plants cultivated in a neighbouring garden. This species should be monitored in this Region, since it shows a high invasion potential in the plain forests of the neighbouring Piemonte (Lonati et al. 2014, Vacchiano et al. 2016, Regione Piemonte 2018).

M. Lonati, S. Ravetto Enri, M. Probo

Lycium boerhaviifolium L.f. (Solanaceae)

+ (NAT) **ITALIA (SAR)**: Cagliari (Cagliari), pressi di Viale Buoncammino (WGS84: 39.221681°N; 9.115990°E), calcari miocenici, 91 m, 23 July 2018, *G. Bacchetta, P.L. Nimis, L. Podda* (FI, CAG). – Naturalized alien species new for the flora of Italy (Sardegna).

This species is native to South America (Levin et al. 2011). In the city of Cagliari, it behaves as a ruderal nitrophilous plant, which colonizes urban sites as walls or slopes, mainly on the Miocene sedimentary stones “Pietra Cantone” and “Pietra Forte”. To our knowledge, this is the first report as a naturalized alien in Europe.

G. Bacchetta, A. Moro, P.L. Nimis, L. Podda

Nassella tenuissima (Trin.) Barkworth (Poaceae)

+ (CAS) **VEN**: Bassano del Grappa (Vicenza), Via Passalacqua (WGS84: 45.771104°N; 11.742118°), bordo di marciapiede, 130 m, 21 May 2017, leg. *G. Busnardo*, det. *F. Prosser* (FI, ROV). – Casual alien species new for the flora of Veneto.

This species of South American origin is increasingly planted in southern Europe, where it shows a tendency to escape from cultivation (Verloove 2005). In Italy, this species was reported, as casual, only from Bolzano (Wilhalm et al. 2017). In Trentino-Alto Adige, it has recently been collected as escaped from cultivation also in the province of Trento (Villa Lagarina, at least 10 tufts born spontaneously in the area surrounding the roundabout - within which the species is cultivated - at the “Rovereto Sud” entrance of the motorway, 4 July 2018, *F. Prosser*, ROV). In Bassano, a few casual specimens have been noticed on the edge of a sidewalk, certainly deriving from a flowerbed a dozen meters away.

G. Busnardo, F. Prosser

Nothoscordum borbonicum Kunth (Amaryllidaceae)

+ (NAT) **SAR**. – Status change from casual to naturalized alien for the flora of Sardegna.

For this Central American species, Ardenghi et al. (2011) proposed the status of casual alien in Sardegna. However, *N. borbonicum* seems actually naturalized, given its abundance in Cagliari and its suburbs, where it colonizes roadsides, fallow land, gardens, ruderal places, and even walls. It has been also found in Olbia (Sassari).

G. Bacchetta, G. Calvia, L. Podda

Oenothera lindheimeri (Engelm. & A. Gray) W.L. Wagner & Hoch (Onagraceae)

+ (CAS) **TOS**: Capraia Isola (Livorno), Isola di Capraia, spontanea sotto il Castello del paese di Capraia Isola (WGS84: 43.048211°N; 9.844937°E), in una fessura tra le rocce, 52 m, 19 May 2018, L. Lazzaro, M. Distefano (FI). – Casual alien species new for the flora of Toscana.

Oenothera lindheimeri is a species native to southern North America (Louisiana and Texas), where it is widely cultivated as ornamental. In Italy, it was already recorded as a casual alien in Lombardia, Veneto, Campania, and Puglia (Galasso et al. 2018a). This species is widely cultivated in other sites in Toscana, mainly in urban flowerbeds. The material was identified according to Raven and Gregory (1972).

M. Mugnai, L. Di Nuzzo, L. Lazzaro, G. Ferretti

Osteospermum ecklonis (DC.) Norl. (Asteraceae)

+ (CAS) **ABR**: Giulianova (Teramo), prato litoraneo presso giardino privato (WGS84: 42.750277°N; 13.973872°E), prato litoraneo, ca. 8 m, 12 July 2018, N. Olivieri (FI). – Casual alien species new for the flora of Abruzzo.

Some individuals of this species have developed in an arid coastal meadow occupied by psammophilous herbaceous vegetation dominated by *Cenchrus longispinus* (Hack.) Fernald, near a private garden. The site is located south of the harbour of Giulianova, not far from the beach. The plants have developed from seeds produced by individuals grown as ornamentals in a nearby garden.

N. Olivieri

Paspalum distichum L. (Poaceae)

+ (INV) **CAL**: Scalea (Cosenza), centro (WGS84: 39.815757°N; 15.787249°E), fessure della pavimentazione, 6 m, 20 August 2014, A. Stinca (PORUN); Roccabernarda (Crotone), Valle Niffi (WGS84: 39.107406°N; 16.873521°E), torrente,

122 m, 26 July 2018, *A. Stinca* (PORUN); *ibidem*, lungo il Fiume Tacina in corrispondenza di loc. Filicetto (WGS84: 39.116179°N; 16.860654°E), argine fluviale, 102 m, 26 July 2018, *A. Stinca* (PORUN); Calopezzati (Cosenza), foce del Torrene Calamitti (WGS84: 39.561422°N; 16.833549°E), argine fluviale, 1 m, 17 August 2018, *A. Stinca* (PORUN); Corigliano-Rossano (Cosenza), fraz. Rossano, tra la foce del Fiume Trionto e la loc. Faro Trionto (WGS84: 39.621369°N; 16.754349°E), terreno fangoso, 4 m, 17 August 2018, *A. Stinca* (PORUN); Cropalati (Cosenza), lungo il Fiume Trionto (WGS84: 39.510398°N; 16.732697°E), argine fluviale, 160 m, 18 August 2018, *A. Stinca* (PORUN); Paludi (Cosenza), loc. V.ne S. Martino (WGS84: 39.539589°N; 16.688078°E), torrente, 220 m, 19 August 2018, *A. Stinca* (PORUN); Strongoli (Crotone), loc. C. Serra Piani (WGS84: 39.264594°N; 17.019728°E), terreno fangoso, 138 m, 22 August 2018, *A. Stinca* (PORUN); Roggiano Gravina (Cosenza), Lago dell’Esaro (WGS84: 39.638220°N; 16.160279°E), sponde, 135 m, 23 August 2018, *L. Peruzzi* (PI No. 011541); Castelsilano (Crotone), Fiume Lese (WGS84: 39.216942°N; 16.865315°E), argine fluviale, 101 m, 8 October 2018, *A. Stinca* (PORUN); Caccuri (Crotone), Fiume Lese (WGS84: 39.231899°N; 16.850924°E), argine fluviale, 125 m, 9 October 2018, *A. Stinca* (PORUN); *ibidem*, Torrente Lepre (WGS84: 39.217925°N; 16.836326°E), argine fluviale, 133 m, 11 October 2018, *A. Stinca* (PORUN); Casabona (Crotone), lungo la Fiumara Vitravo (WGS84: 39.254953°N; 16.905314°E), argine fluviale, 140 m, 12 October 2018, *A. Stinca* (PORUN). – Status change from naturalized to invasive alien for the flora of Calabria.

Paspalum distichum is recorded for all Italian regions, with the exception of Valle d’Aosta and Trentino-Alto Adige (Galasso et al. 2018a). The latter authors reported this species as naturalized in Calabria. However, we found large populations of this neophyte mostly along the banks of several rivers, streams, and lake-shores of the provinces of Crotone, Catanzaro, and Cosenza, forming belts of 1 to 60 m. In addition to the places indicated in the samples, we have observed a large population also along the Crocchio River (Cropani, Catanzaro province, WGS84: 38.916399°N; 16.826309°E). Accordingly, this species should be considered invasive in Calabria.

A. Stinca, F. Bartolucci, L. Peruzzi

Pontederia cordata L. (Pontederiaceae)

+ (NAT) **LAZ**: Sabaudia (Latina), loc. Bella Farnia, Strada Litoranea (WGS84: 41.367494°N; 12.978081°E), fosso, 110 m, 25 June 2013, *M. Iberite* (FI, RO). – Naturalized alien species new for the flora of Lazio.

This is the first record of this taxon for peninsular Italy. Galasso et al. (2018a) report it as a naturalized alien for Lombardia and Veneto, and Montanari et al. (2015) recorded its occurrence in Emilia-Romagna. The population, still present in 2018, covers an extension of about 5 m²; flowering was observed, but the plants probably reproduce only vegetatively. *Pontederia cordata* is recognized since many years to be a potentially

invasive species in Europe, namely because of its clonal growth ability (Weber and Gut 2004). This calls a careful monitoring.

E. Fanfarillo, D. Iamonico, M. Iberite, M. Latini, G. Nicolella

Romulea rosea (L.) Eckl. (Iridaceae)

+ (NAT) **SAR**: Cardedu (Nuoro), Monte Ferru (WGS84: 39.743000°N; 9.624400°E ± 100 m), prato con modesta ritenuta idrica invernale, 540 m, SE, piante concentrate nel prato, con una buona densità; individui sparsi sono presenti fino a un centinaio di metri di distanza, sconfinando nella rada macchia mediterranea, 23 March 2017, *G. Mereu* (MSNM); *ibidem*, propaggine nord-orientale del Monte Ferru, versante E (WGS84: 39.743000°N; 9.624400°E ± 100 m), prato e bordo della macchia mediterranea, 540 m, SE, 15 April 2018, *G. Mereu* (FI). – Naturalized alien species confirmed for the flora of Sardegna.

The presence of this species was considered doubtful for Sardegna and for Italy in Galasso et al. (2018a). It appears to be naturalized since a long time in the indicated area. Evidence suggests that the plants were already present in 1992, when the site was subjected to human intervention following the creation of the “Cantiere forestale di Monte Ferru”. Considering that there are no other reports for Italy and that the population reported for France has been identified as *Romulea arnaudii* Moret (Moret et al. 2000), this naturalized population is the only one currently documented in Italy and Europe.

G. Mereu

Rudbeckia triloba L. (Asteraceae)

+ (CAS) **TOS**: San Marcello Piteglio (Pistoia), fraz. Maresca, tra le loc. Case Bizzarri e Case Alte (WGS84: 44.053978°N; 10.857800°E), scarpata erbosa al margine della strada, 866 m, 10 November 2017, *G. Ferretti, F. Ferraro* (FI). – Casual alien species new for the flora of Toscana.

Rudbeckia triloba is an alien species from North America, recorded in Italy for Valle d’Aosta, Piemonte, Lombardia, Trentino-Alto Adige, and Veneto (Galasso et al. 2018a). It is used as ornamental and the recorded plants may have originated from a private garden. The plants were identified according to Ardenghi and Galasso (2013) and Maslo and Šarić (2018).

M. Mugnai, L. Di Nuzzo, L. Lazzaro, G. Ferretti

Salvia hispanica L. (Lamiaceae)

+ (CAS) **LAZ**: Bracciano (Roma), Vigna di Valle, Centro Sportivo dell’Aeronautica Militare presso l’Aeroporto di Vigna di Valle (WGS84: 42.084050°N; 12.222806°E),

riva del lago, 157 m, 29 October 2017, leg. S. Buono, det. S. Magrini (FI). – Casual alien species new for the flora of Lazio.

Salvia hispanica, commonly known as ‘chia’, is a species native to central and southern Mexico and Guatemala (Cahill 2003). This species is increasingly cultivated in Europe for human food, as its seeds are a rich source of omega-3 and other nutraceuticals (Muñoz et al. 2013). The first record of its occurrence as a casual alien in Italy, from Marche, is very recent (Ballelli 2015). Galasso et al. (2018a) recorded this species also for Lombardia, Trentino-Alto Adige, Emilia-Romagna, and Sicilia. A single individual was observed on sandy soil near Lake Bracciano, together with other alien species, such as *Amorpha fruticosa* L., *Datura stramonium* L., *Pavonia hastata* Cav. (Galasso et al. 2017), and *Physalis peruviana* L. (Galasso et al. 2018b). The plant regularly develops flowers and fruits.

S. Buono, S. Magrini

Sesbania punicea (Cav.) Benth. (Fabaceae)

+ (NAT) **SAR**. – Status change from casual to naturalized alien for the flora of Sardegna.

Sesbania punicea, native to South America (Erb 1980), is now widespread in many countries as an ornamental plant, becoming locally invasive. Its first report from Sardegna was by Camarda (1998). After a few years, Brundu et al. (2003) and Camarda et al. (2004) indicated it as naturalized in the island. Later, several authors confirmed the same status (e.g., Podda et al. 2011, Camarda et al. 2016, Puddu et al. 2016), but finally Bacchetta and Podda in Galasso et al. (2018a) reported it as a casual alien. Recently, a new locality on sandy substrata was observed, near the dam along Rio Leni (Villacidro), where about 100 shrubs colonize a slope.

G. Bacchetta, G. Brundu, L. Podda

Setaria italica (L.) P.Beauv. subsp. *pycnocoma* (Steud.) de Wet (Poaceae)

+ (CAS) **MAR**: Acqualagna (Pesaro e Urbino), fraz. Furlo, loc. Abbazia di San Vincenzo al Furlo (WGS84: 43.636404°N; 12.692410°E), scarpata stradale, 185 m, 28 July 2018, G. Mei (FI, ANC, Herb. G. Mei). – Casual alien subspecies new for the flora of Marche.

The presence of *Setaria italica* subsp. *pycnocoma* was not yet reported for Marche (Galasso et al. 2018a). This species has been found in an area previously subjected to weeding of the road margins. Most of the population occurs only along road margins, while a few plants have been observed in the nearby abandoned fields. In Italy, this plant colonizes only strongly anthropized areas (Bossard et al. 2000), such as urban suburbs, abandoned railway tracks, road margins, flowerbeds and, less frequently, recently abandoned fields (Banfi and Galasso 2010, Celesti-Grapow et al. 2009).

G. Mei

Sicyos angulatus L. (Cucurbitaceae)

+ (INV) **LAZ**: Morolo (Frosinone), argini e sponde del Fiume Sacco in loc. Ponte di Morolo (WGS84: 41.652513°N; 13.218388°E), argini e sponde fluviali, 150 m, 8 September 2018, *E. Fanfarillo* (RO); Supino (Frosinone), argini e sponde del Fiume Sacco in loc. Ponte di Supino (WGS84: 41.638706°N; 13.253182°E), argini e sponde fluviali, 147 m, 8 September 2018, *E. Fanfarillo* (RO); Patrica (Frosinone), sponde del Fiume Sacco in loc. Tomacella (WGS84: 41.608884°N; 13.290797°E), sponde fluviali, 139 m, 8 September 2018, *E. Fanfarillo* (RO). – Status change from casual to invasive alien for the flora of Lazio.

This species was first recorded in Lazio in 2002 along the Sacco River in Morolo (Frosinone), where its presence was defined “quite rare” (Salerno et al. 2006). After resurveying the same locality and adjacent ones in 2018, this taxon appeared widespread along the river, forming dense populations both on the ground and on trees on a surface of about 2 km², and sparsely invading the roadsides. Further down the river, two new sites of occurrence were found at a distance of 4 and 10 km.

E. Fanfarillo, G. Nicolella

Styphnolobium japonicum (L.) Schott (Fabaceae)

+ (CAS) **ABR**: Teramo (Teramo), margine di parcheggio presso la Circonvallazione Ragusa (WGS84: 42.660794°N; 13.703624°E), margine, ca. 265 m, 21 June 2018, *N. Olivieri* (FI). – Casual alien species new for the flora of Abruzzo.

The species is present with some young individuals in a narrow belt of uncultivated land at the edge of a car park set in an internal courtyard, between the buildings, located behind the church of Sant’Agostino. These young plants, which may exceed the height of 1 m, originated from the seeds produced by a large individual growing on one side of the parking lot. *Styphnolobium japonicum* is a tree native to East Asia, which was introduced in Italy in 1799 (Maniero 2015).

N. Olivieri

Sympyotrichum squamatum (Spreng.) G.L.Nesom (Asteraceae)

+ (INV) **CAL**: Roggiano Gravina (Cosenza), Lago dell’Esaro (WGS84: 39.638220°N; 16.160279°E), sponde, 135 m, 23 August 2018, *L. Peruzzi* (PI No. 011540). – Status change from naturalized to invasive alien for the flora of Calabria.

Sympyotrichum squamatum is recorded for all Italian regions, with the exception of Valle d’Aosta (Galasso et al. 2018a). The latter authors reported this species as naturalized in Calabria but, given the extent of occurrence and density observed at the lakeshore, it is better considered as an invasive alien: a narrow belt of *S. squamatum* surrounded a large *Paspalum distichum* L. population in slightly drier areas, all around the lake.

L. Peruzzi

***Tradescantia pallida* (Rose) D.R.Hunt (Commelinaceae)**

+ (CAS) **SIC**: Misilmeri (Palermo), Via Palmerino (WGS84: 38.035184°N; 13.455890°E), bordi di marciapiedi, 11 June 2018, F. Scafidi (FI). – Casual alien species new for the flora of Sicilia.

Some young individuals of this species were found along the edges of a sidewalk; they probably originated from seeds produced by cultivated plants in private flower-beds. This species was likely introduced in Italy for ornamental purposes, and it was so far known as casual alien for Lazio, Calabria, and Sardegna (Galasso et al. 2018a).

F. Scafidi, G. Domina

Nomenclature and distribution updates from other literature sources

Nomenclature, status, and distribution updates according to Fiori (1902), Leigheb and Cameron-Curry (1999), Zohary and Hopf (2000), Orlandi and Arduini (2010), Levin et al. (2011), Alessandrini et al. (2012), Bona (2015), Montanari et al. (2015), Ardenghi and Polani (2016), Korotkova et al. (2017), Scafidi and Raimondo (2017, 2018), Selvi et al. (2017), Arrigoni (2018), Belyaeva et al. (2018), Brock et al. (2018), Carta et al. (2018), Galasso (2018), Gallo et al. (2018), Gargano (2018), Mayoral et al. (2018), Mosyakin et al. (2018), Motti et al. (2018), Nemati et al. (2018), Nesson (2018), Pellegrini (2018), Pellegrini et al. (2018), Pignatti (2018), Särkinen et al. (2018), Siadati et al. (2018), Sukhorukov et al. (2018), Truzzi (2018), Turland et al. (2018), and corrections to Bartolucci et al. (2018) and Galasso et al. (2018a) are provided in Supplementary material 1.

G. Galasso, F. Bartolucci

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Supplementary material I

Supplementary data

Authors: Gabriele Galasso, Fabrizio Bartolucci

Data type: species data

Explanation note: 1. Nomenclature updates; 2. Note updates; 3. Distribution updates; 4. Synonyms, misapplied or included names.

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